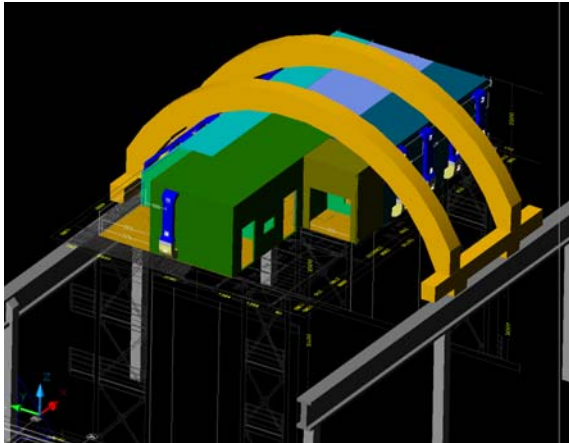
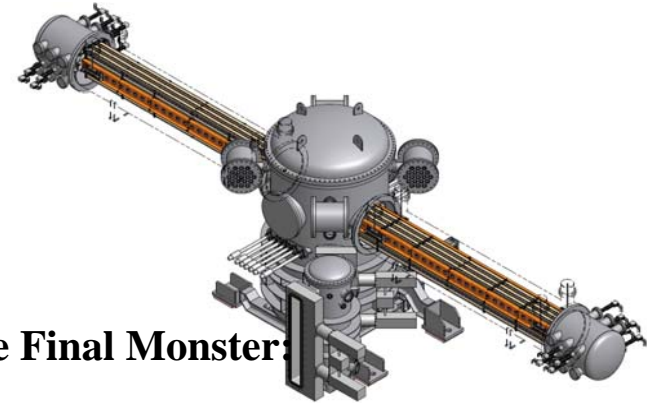




# TG5: Clean Room and Lock System – Status Report

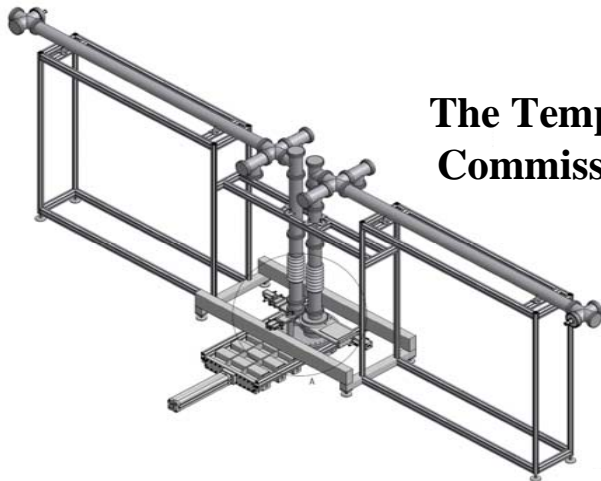


The Clean Room

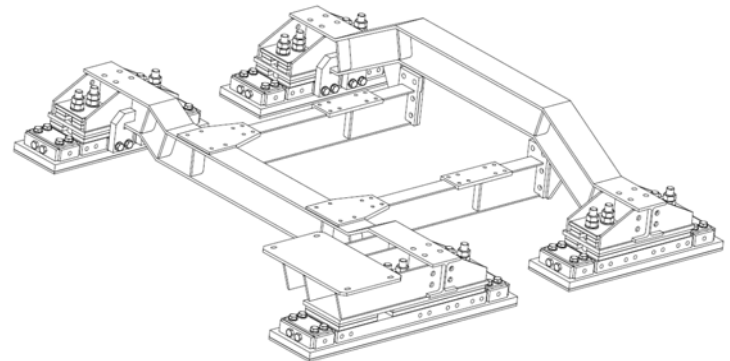


The Final Monster

- Linear Pulley
- Support Structure
- Installation Sequence



The Temporary  
Commissioning  
Lock







## Clean Room and Lock System – Status Report

### Clean Room Schedule:

Tender Specifications expected this week

Open tender among three companies CW 25

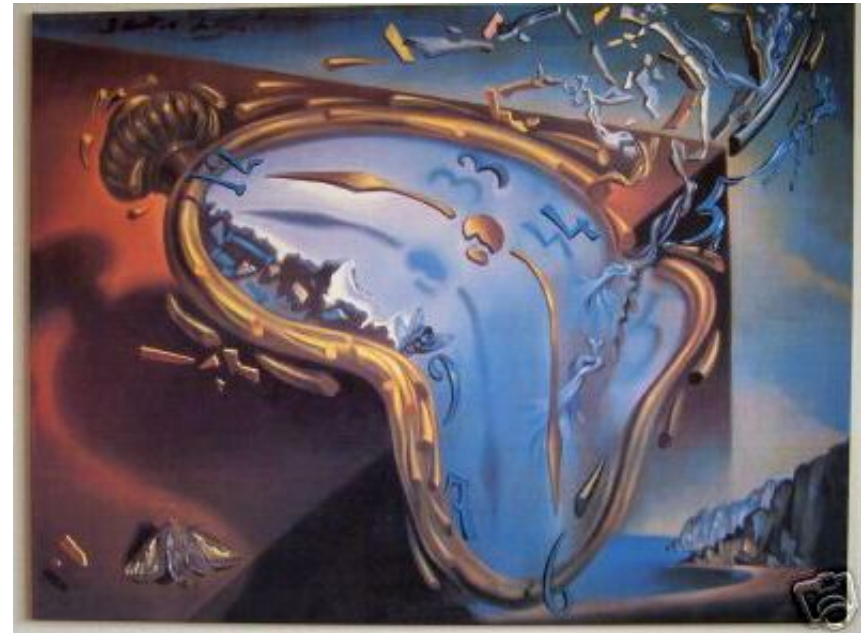
Submission deadline CW27

Sign Contract CW 29

Min. prep time needed: 6 + 6 weeks

→Earliest possible start: CW 41 (beginning of Oct.)

→Ferragosto inbetween → realistic start CW45 (3.Nov)





## A Temporary Lock System



### The temporary lock system:

**Installation of the final lock system will not be possible before mid 09**

**We have the possibility to go for a commissioning phase and fill cryostat and water tank before installing the monster.**

**→ Check movements of cryostat neck with respect to superstructure beams and adjust lock support structure!**

**→ Check Background conditions in cryostat while still accessible via clean room!**

**→ Check Phase I detectors and electronics**

**The temporary lock is being designed by MPI Munich with help from LNGS under realistic circumstances.**

**The original linear pulley system is being used. For the lock cylinder and integration only standard materials are used.**

**→ No considerable time delay due to additional development (<2 months)**

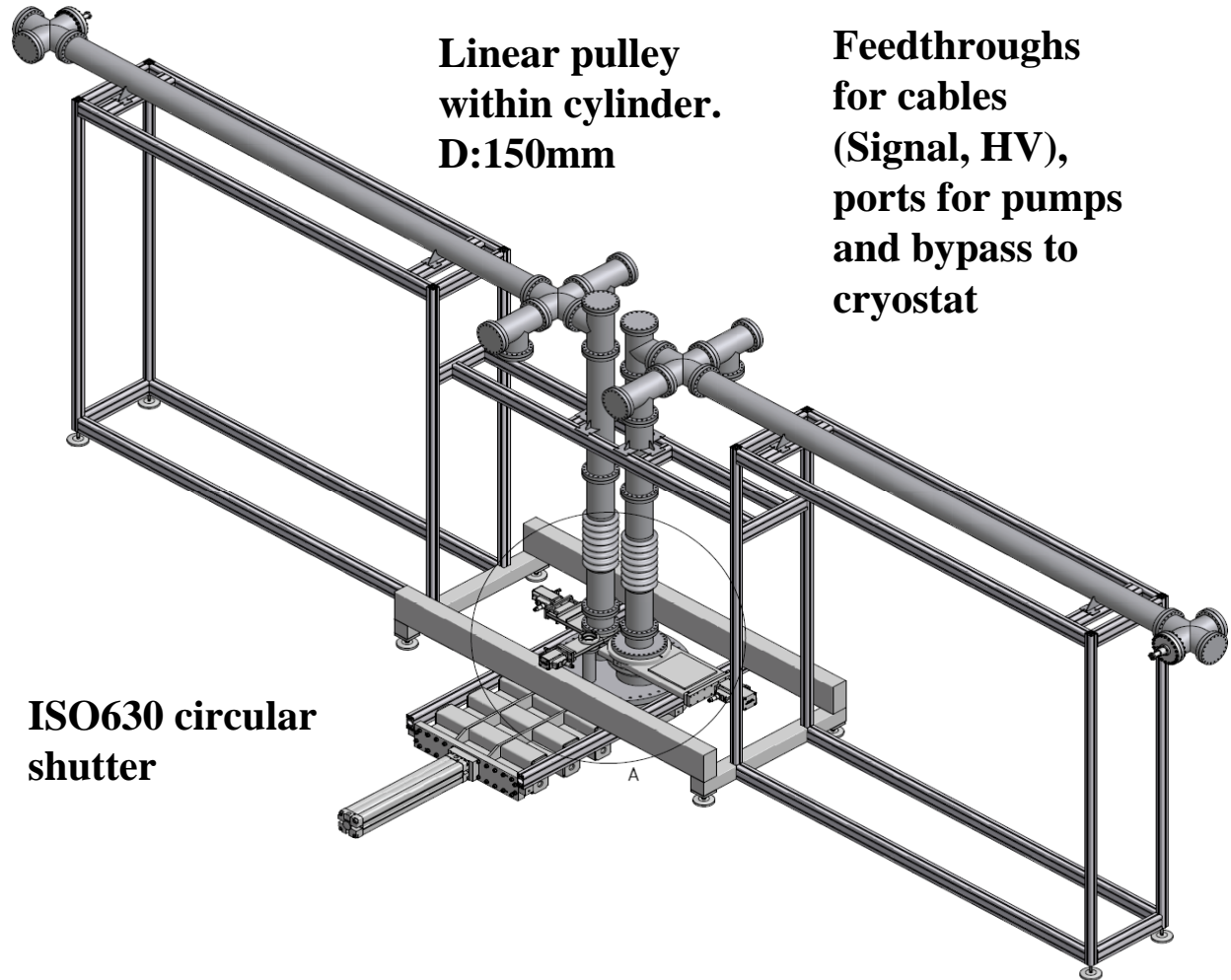




# A Temporary Lock System

Feedthrough for motor

Support structure designed by LNGS (Donato Orlandi)



Linear pulley within cylinder.  
D:150mm

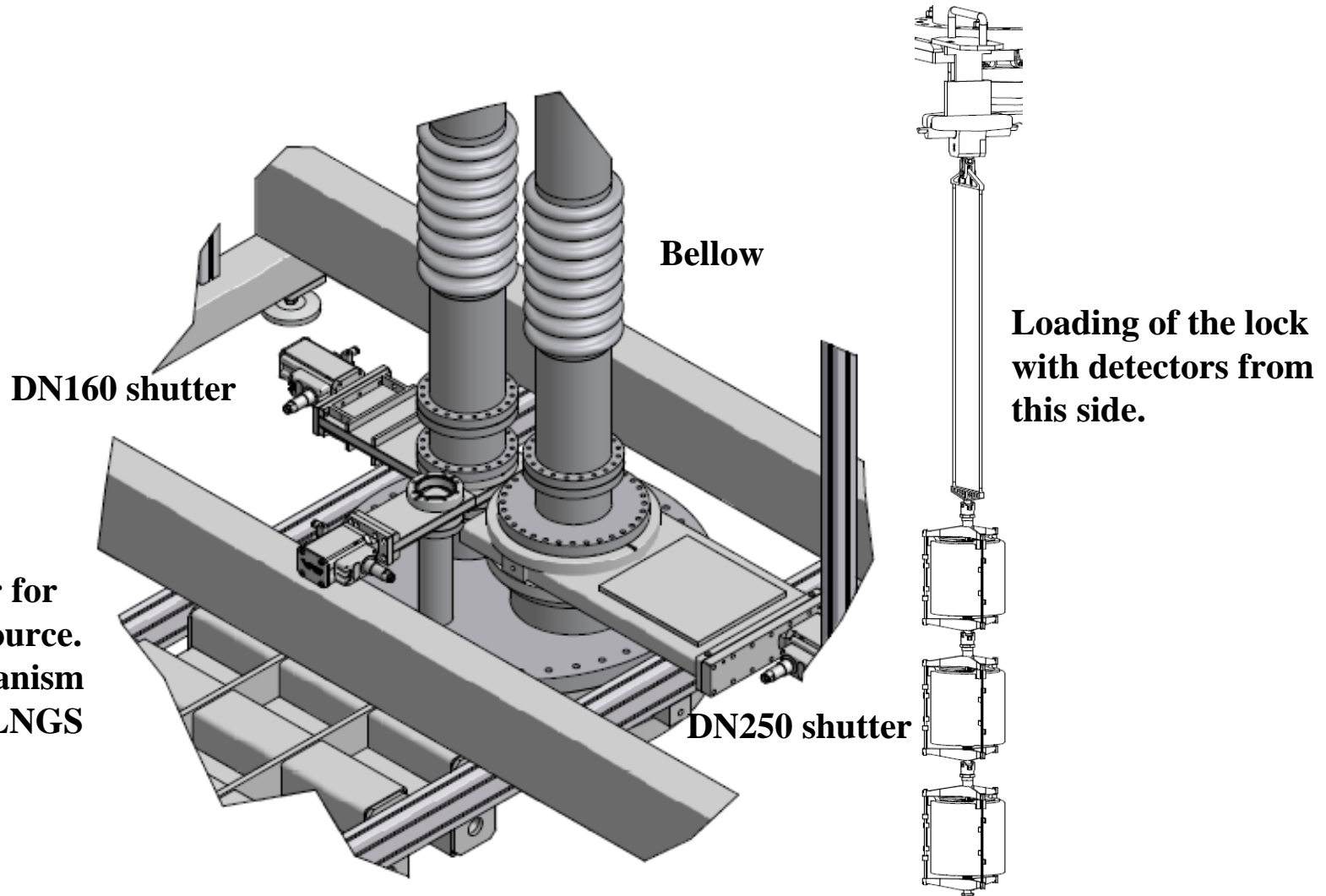
Feedthroughs for cables (Signal, HV), ports for pumps and bypass to cryostat

ISO630 circular shutter





# A Temporary Lock System



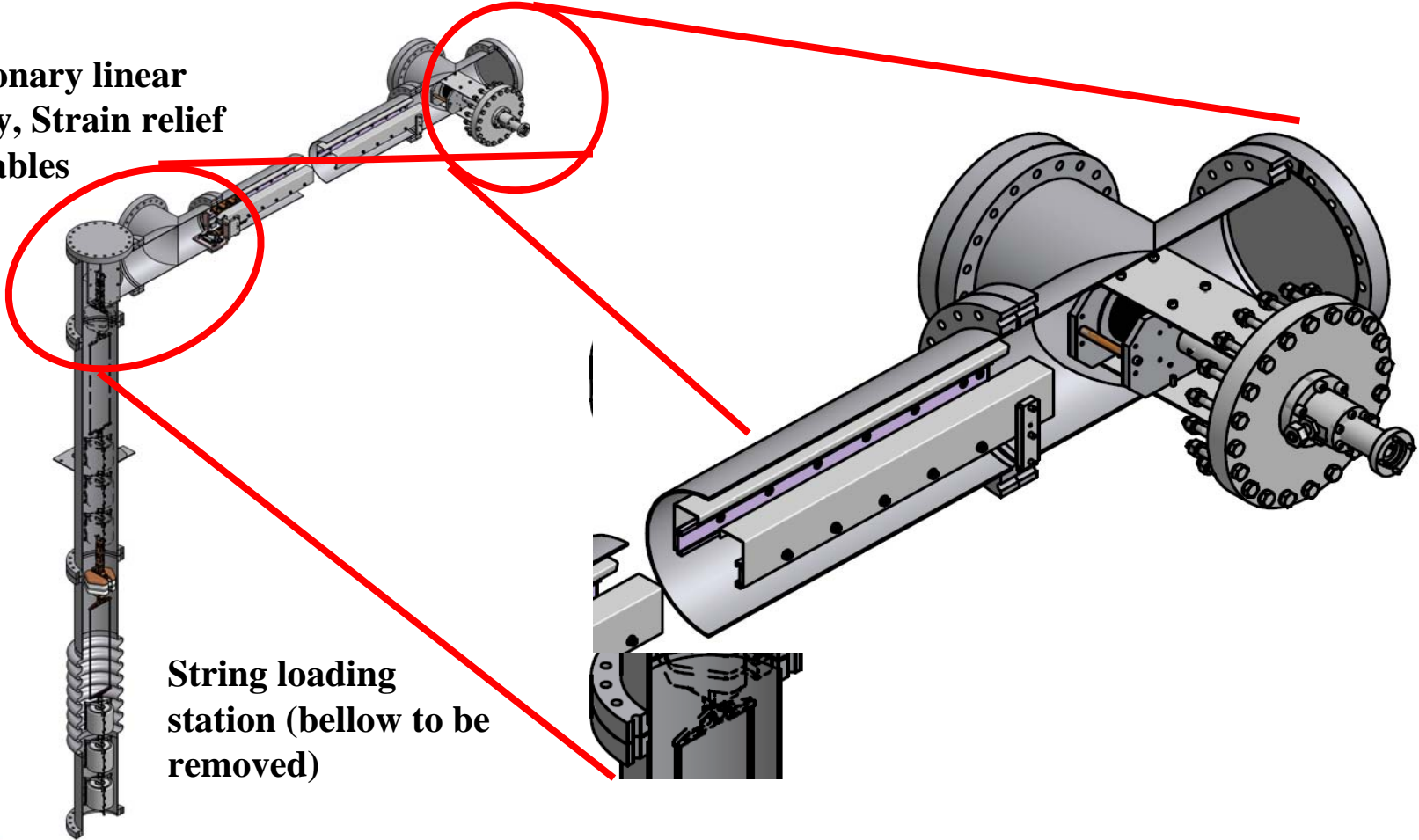
DN63 shutter for calibration source. Source mechanism designed by LNGS



# A Temporary Lock System

Feedthrough for motor

Stationary linear pulley, Strain relief for cables



String loading station (bellow to be removed)

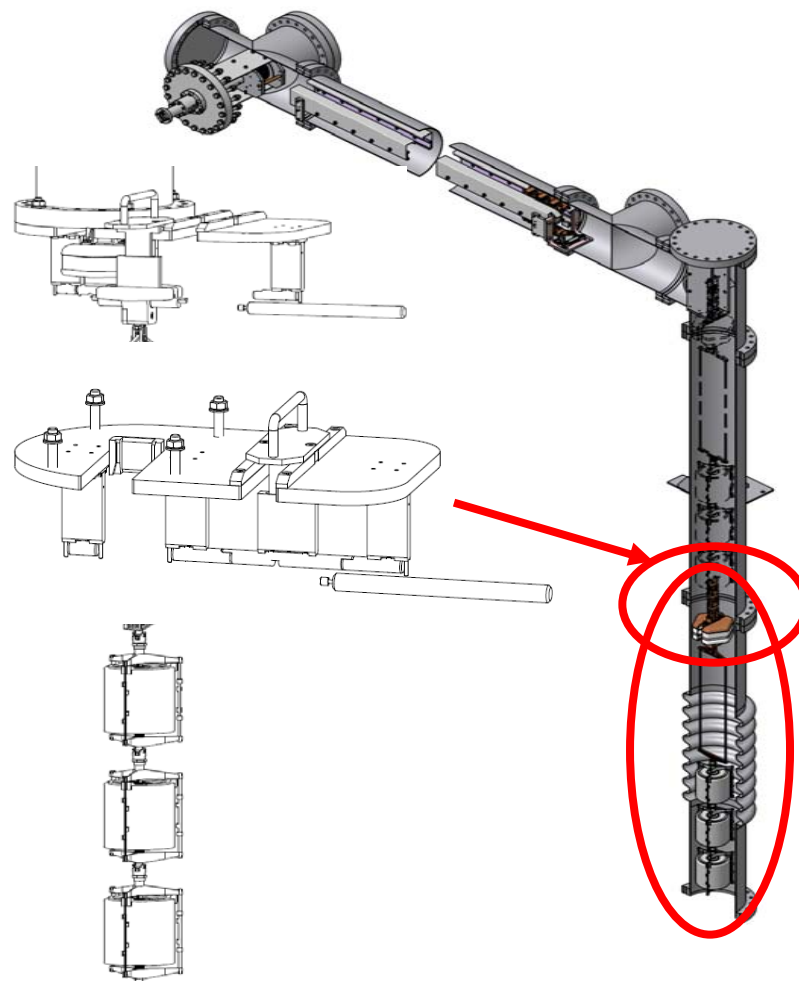




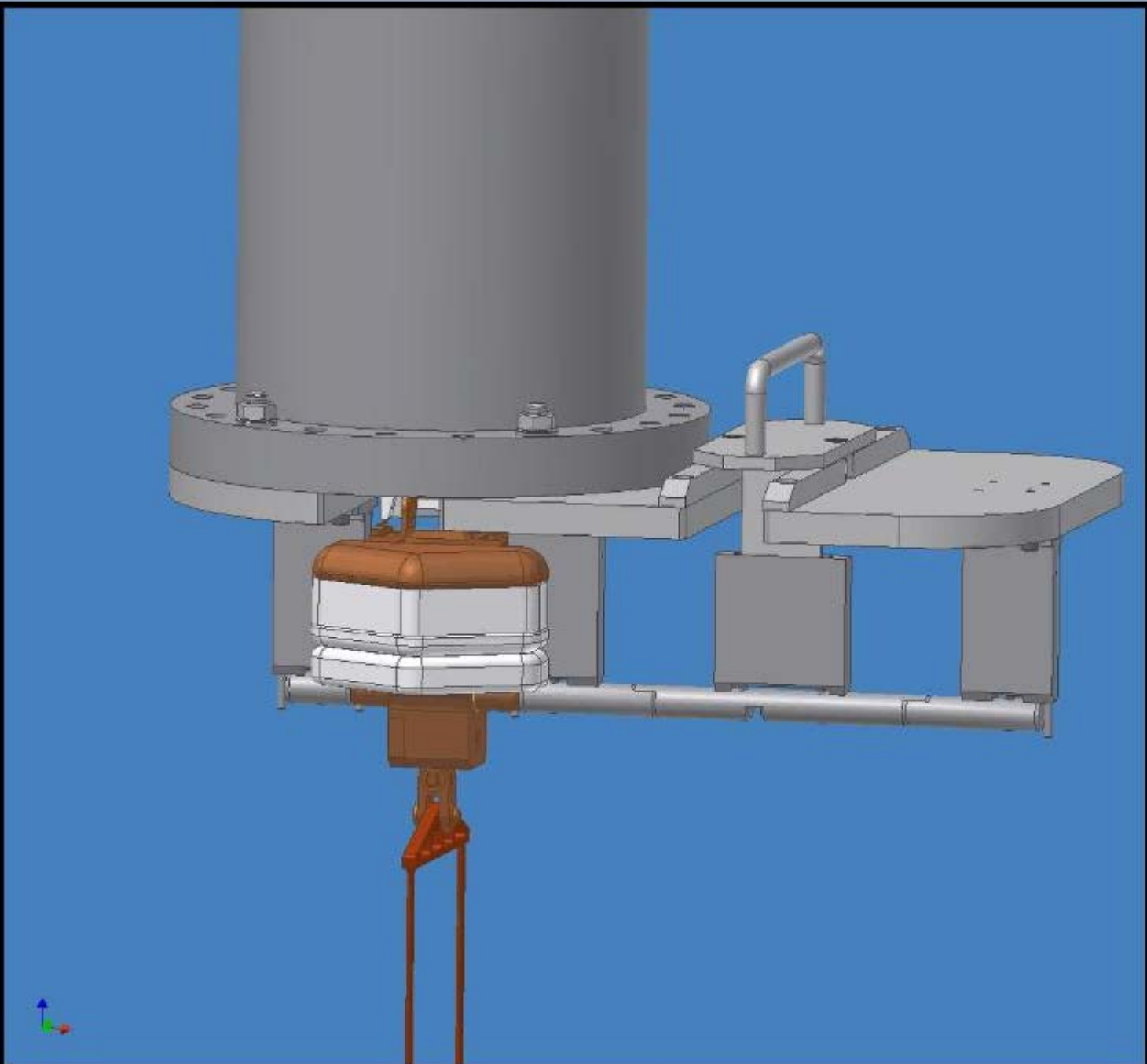
## Temporary Lock: String Installation Sequence

### Linear Pulley – String Adapter:

- Linear pulley in upper position
- Uninstall removable cylinder
- Mount linear pulley –string adapter to cylinder
- Place string onto adapter
- Move string from adapter to linear pulley
- Slightly lower linear pulley
- Remove adapter
- Bring linear pulley to upper position
- Close removable cylinder

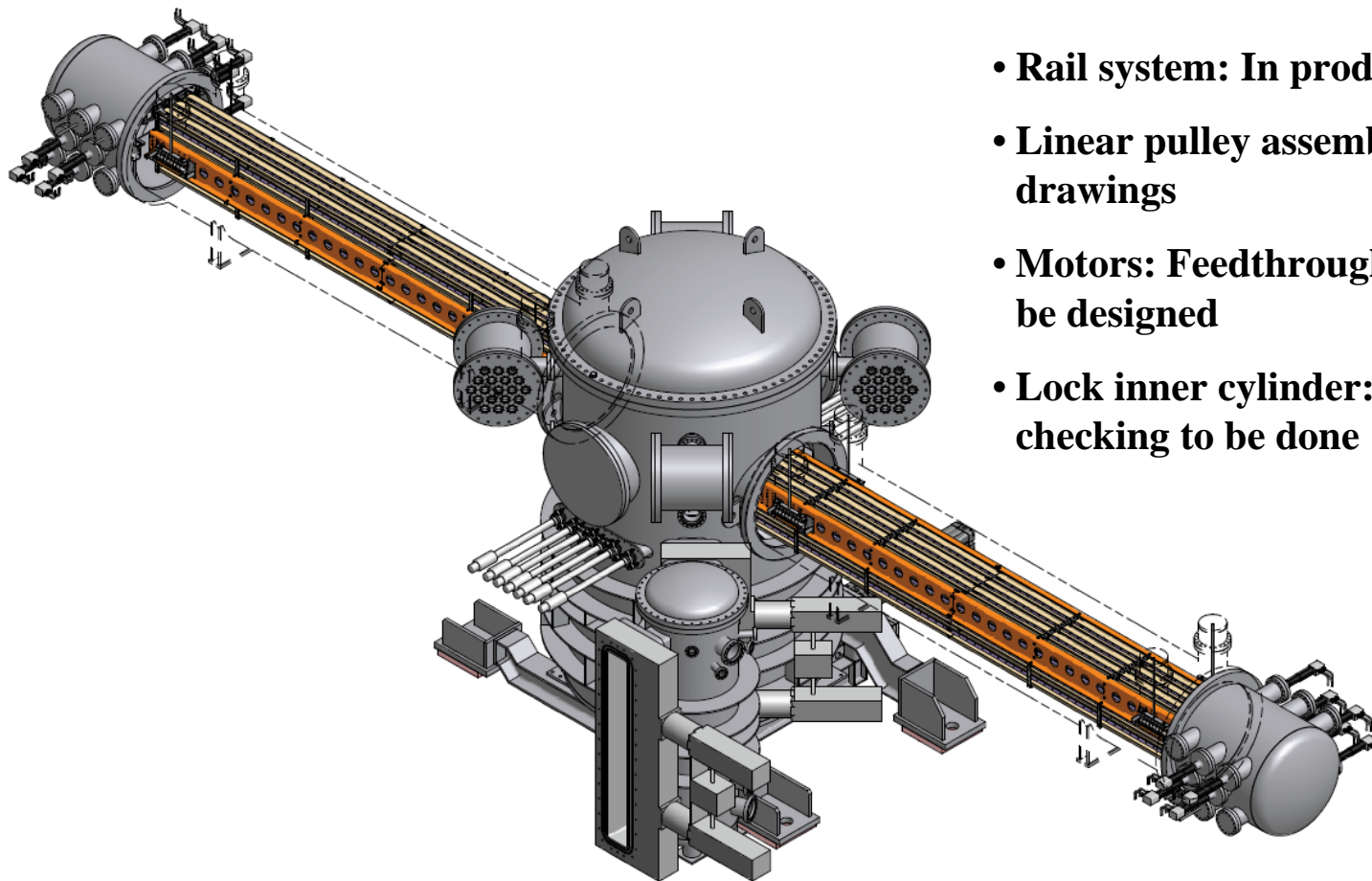








## The Final Lock Status



- **Rail system:** In production
- **Linear pulley assemblies:** production drawings
- **Motors:** Feedthrough designed, End cap to be designed
- **Lock inner cylinder:** Pressure vessel code checking to be done

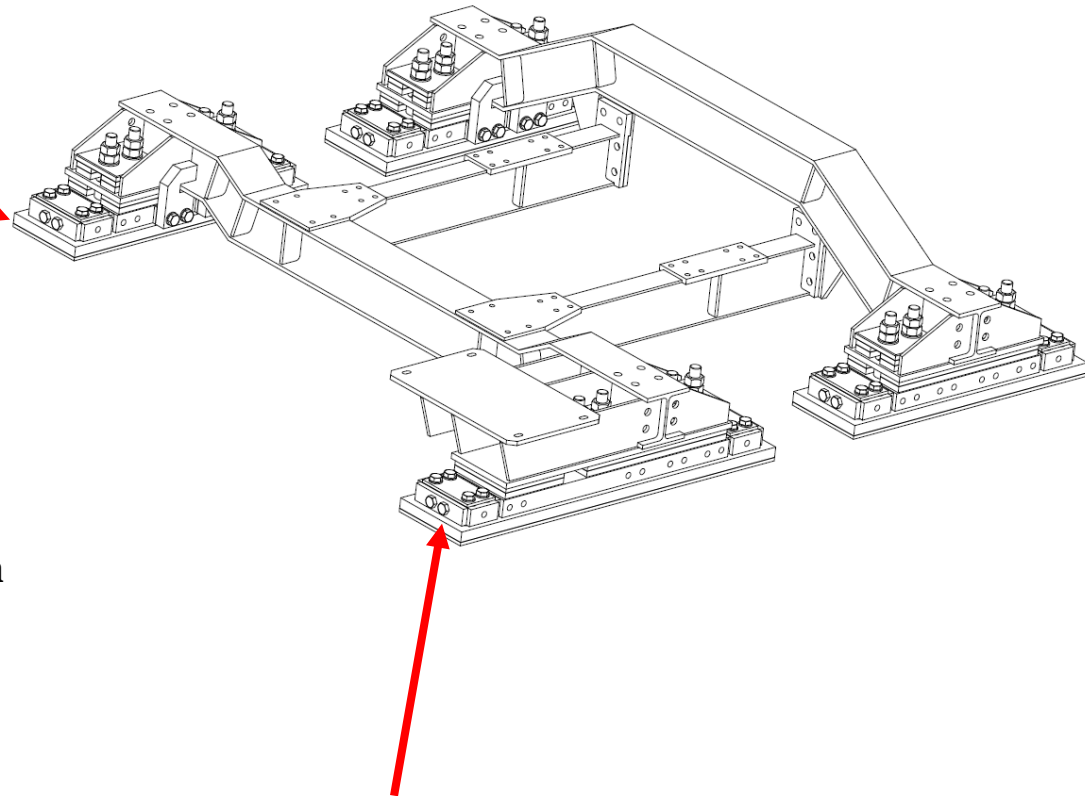




## Lock Support Structure

Few tons of weight have to be supported

- The lock should not see the complete frequency spectrum of the superstructure → Decoupling with Sylomer
- Forces onto Superstructure have to be rather homogeneously distributed
- Support Structure may not bent more than 3mm after lock installation → Massive construction
- Tolerances of movements up to +/-10mm have to be balanced
- Earthquake safety has to be considered → Forces of max 100N/mm<sup>2</sup> allowed on critical positions

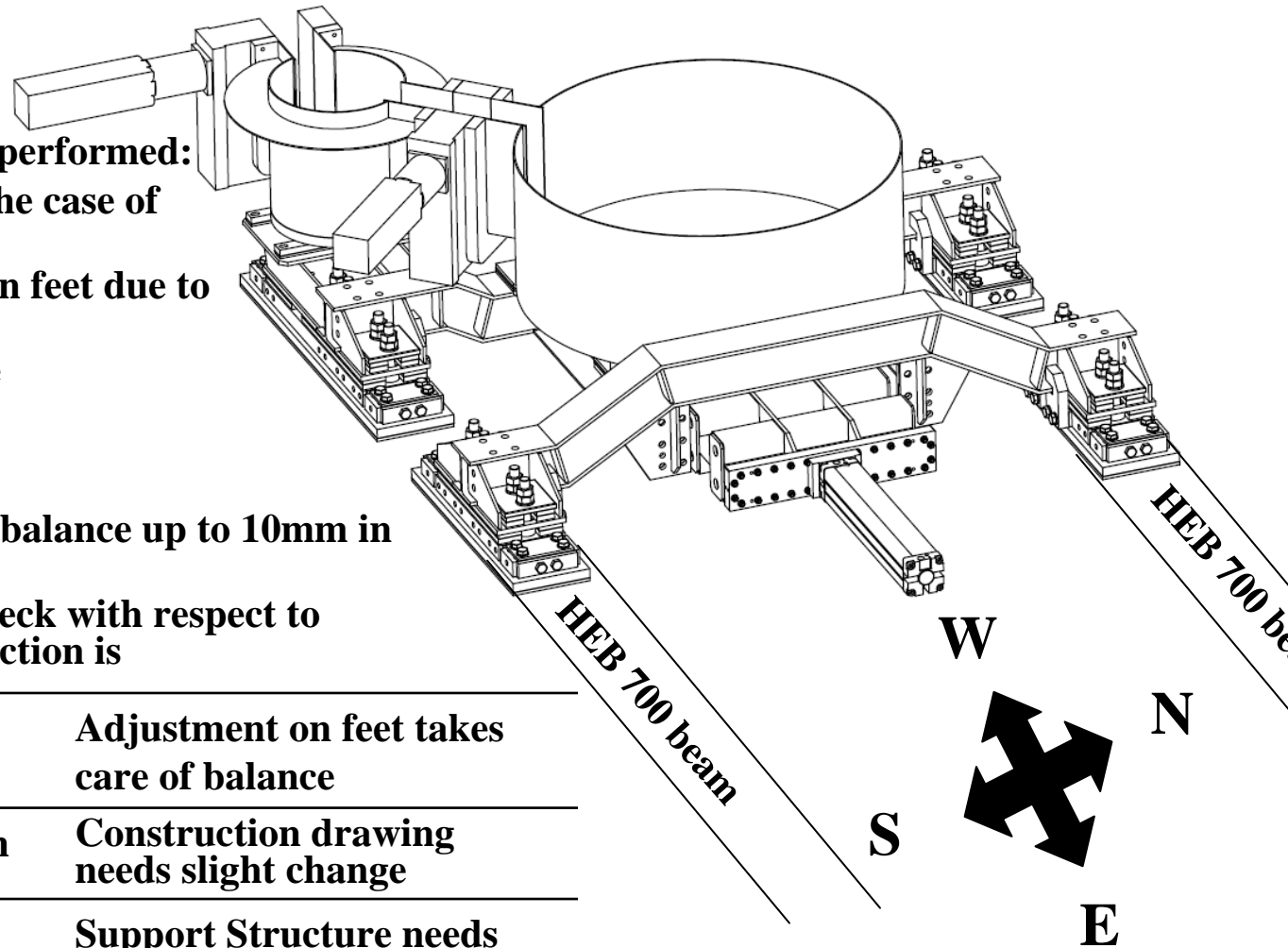


Outer lock sits on this foot





## Lock Support Structure



**Design has finished**

**FE calculations have been performed:**

**Max. stress: 85N/mm<sup>2</sup> in the case of lateral 0.6g acceleration**

**Relative movement between feet due to lock weight: < 2mm**

**→Support structure viable**

**Tolerances:**

**The support structure can balance up to 10mm in S-N direction**

**If movements of cryostat neck with respect to HEB 700 beams in NS direction is**

**< 10mm:**

**Adjustment on feet takes care of balance**

**Between 10mm and 20mm**

**Construction drawing needs slight change**

**> 20mm**

**Support Structure needs review (→Delay)**

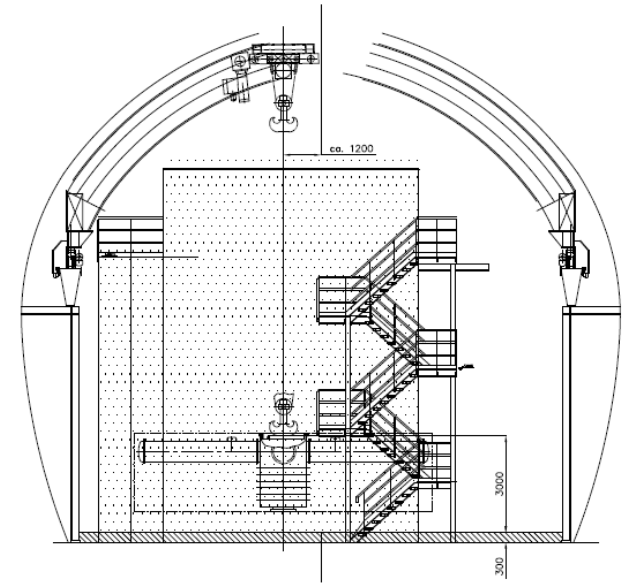
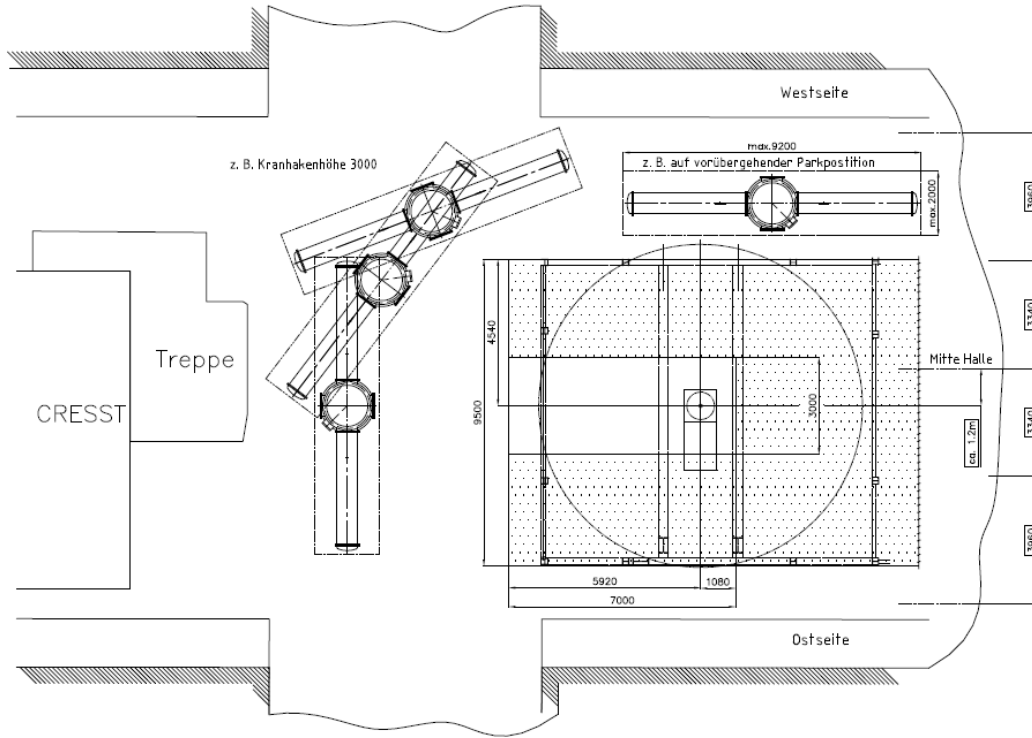






# Final Lock Installation Sequence

(Stand Mai 2008)





## Final Lock Installation Sequence

The lock mounting sequence consists of the following steps:

- Mounting of certified harness to the lock system at MPI Munich.
- Test lifting of lock system with MPI crane. Adjustment of center of mass.
- Transport of the lock system to the LNGS
- Unloading lock system from truck using 40t crane
- Lock is now standing on TIR tunnel with cable arms aligned in W-E direction
- Attach two manipulation ropes (~15m) to Lock system
- Test lift and adjust center of mass
- Lift up to 12.6 m height
- Use manipulation ropes (one from CRESST staircase, one from GERDA building) to turn orientation of cable arms by 90 deg. to N-S direction.
- Move crane above center of cryostat
- Move down lock to 5 mm above cryostat upper flange (9755mm)
- Move lock Support structure to final position
- No work below hanging load has to be performed
- Mount feet of lock support structure to HEB700 beams
- Move down lock onto bellow upper flange, resting the lock on lock support structure
- Attach lock to lock support structure (bolts)
- Adjust feet position of lock support structure to center of beam
- Attach Feet of lock support structure to HEB700 beams
- Leak test lock-shutter HELICOFLEX seal
- Remove crane incl. harness from lock
- Remove stiffening from bellow.

**To be discussed in separate meeting Tuesday 16:30 to 17:30**





# The GERDA Munich group is on its way

